

UNIVERSITY of HOUSTON

CULLEN COLLEGE of ENGINEERING

Department of Civil & Environmental Engineering

CIVE 6111 Graduate Seminar Series

Ayse Asatekin

Assistant Professor
Chemical and Biological
Engineering
Tufts University

Water Filtration Membranes by Zwitterionic Polymer Self-Assembly

Friday, February 5th, 2016

2:45 pm - 4:00 pm

Room: Classroom Business Building 104

Abstract: Membranes are a key technology in generating safe drinking water and wastewater treatment, and a crucial separation technology used in purification of chemicals, pharmaceuticals, and food products. To be commercially viable, membranes need to exhibit high flux and fouling resistance, and be readily fabricated. We aim to develop new materials that address these challenges through polymer self-assembly. This presentation focuses on novel membrane materials developed in our lab with a focus on environmental applications such as wastewater and drinking water treatment. Zwitterions, which have equal numbers of positively and negatively charged groups, strongly resist fouling. They also self-assemble into clusters as small as ~ 1 nm due to their strong dipole interactions. Our group utilizes these interesting functional groups to design new membranes with improved performance for various applications, especially in the areas of industrial wastewater treatment and bioprocessing.

About the speaker:



Dr. Ayse Asatekin is an assistant professor in the Chemical and Biological Engineering Department at Tufts University. She is also the co-founder and scientific advisor of Clean Membranes, Inc., a start-up company that is commercializing her polyacrylonitrile-based membrane technology that she began developing during her doctoral research. She holds B.S. degrees in Chemical Engineering and Chemistry from the Middle East Technical University (METU) in Ankara, Turkey. She received her Ph.D. in Chemical Engineering from the Program in Polymer Science and Technology at the Massachusetts Institute of Technology (MIT) in 2009. She was awarded the Materials Research Society's Graduate Student Gold Award for this work on new fouling resistant membrane materials for wastewater treatment. After two years of post-doctoral work with Prof. Karen Gleason at MIT, she joined Clean Membranes full time as principal scientist. She joined Tufts faculty in 2012. Her research interests are in developing novel membranes for clean water and energy-efficient separations. She is also interested in multi-functional membranes, polymer science, and biomaterials.